# THE OFFICE OF REGULATORY STAFF

# DIRECT TESTIMONY AND EXHIBITS

# OF

# DR. BEN JOHNSON



# DOCKET NO. 2004-357-W/S
# APPLICATION OF
# CAROLINA WATER SERVICE, INC.
# FOR ADJUSTMENT OF
# RATES AND CHARGES

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2    OF BEN JOHNSON, PH.D.

3    On Behalf of

4    THE STATE OF SOUTH CAROLINA

5    OFFICE OF REGULATORY STAFF

6    Before the

7    PUBLIC SERVICE COMMISSION OF

8    SOUTH CAROLINA

9

10    Docket No. 2004-357-W/S

11

12    *Introduction*

13

14    **Q.    Would you please state your name and address?**

15    A.    Ben Johnson, 2252 Killearn Center Blvd, Tallahassee, Florida.

16

17    **Q.    What is your present occupation?**

18    A.    I am a consulting economist and president of Ben Johnson Associates, Inc.®, an

19    economic research firm specializing in public utility regulation.

20

21    **Q.    Have you prepared an appendix that describes your qualifications in regulatory and**

22    **utility economics?**

23    A.    Yes. Appendix A, attached to my testimony, will serve this purpose.

24

1    **Q.**    **Have you prepared any exhibits in support of your testimony?**

2    **A.**    Yes. I have an exhibit consisting of 7 schedules. All schedules were prepared under my

3    supervision and are true and correct to the best of my knowledge.

4

5    **Q.**    **What is your purpose in making your appearance at this hearing?**

6    **A.**    My firm has been retained by the Office of Regulatory Staff to assist in preparing and

7    presenting evidence in this proceeding with respect to the cost of capital of Carolina

8    Water Service, Inc. (Carolina Water, the Company).

9    My testimony has six sections, of which this introduction is the first. In the

10    second section, I discuss the Company's proposed capital structure and cost of debt. In

11    the third section, I describe the comparable earnings and market approaches to

12    determining the cost of equity. In the fourth section, I present the results of my

13    comparable earnings analysis. In the fifth section, I present the results of my market

14    approach analysis. In the sixth and final section, I summarize my conclusions and

15    recommendations.

16

17    *Capital Structure and Cost of Debt*

18

19    **Q.**    **Let's turn to the second section of your testimony, regarding the Company's capital**

20    **structure and cost of debt. To begin with, what is the Company's requested capital**

21    **structure?**

22    **A.**    Carolina Water has proposed a capital structure of 59.23% debt, and 40.77% equity. [See,

23    e.g., Application, Exhibit B, p. 5] This is the same as the consolidated capital structure of

1    Carolina Water's parent company, Utilities, Inc.

2

3  Q.  **Are there other options that could also be considered in a case like this?**

4  A.  Yes. Where an operating utility is the subsidiary of another company, there are several

5     possibilities: the subsidiary capital structure, the consolidated capital structure of the

6     parent and its subsidiaries, an imputed capital structure, or a hypothetical capital

7     structure. If the parent's capital structure is used, the presence of any unregulated

8     subsidiaries may present additional complications that must be considered in determining

9     the appropriate capital structure for a regulated subsidiary.

10    Typically, unregulated firms have a higher degree of business risk than regulated

11    companies and therefore use a more conservative capital structure--one consisting of

12    more common equity. Thus, because the parent's unregulated operations are riskier than

13    the regulated operations they have the effect of raising the parent's equity ratio above that

14    of a pure regulated utility. If significant, the investment in these unregulated operations

15    should be removed from the parent's capitalization before the latter is imputed to a

16    regulated subsidiary.

17

18  Q.  **Do you believe it would be reasonable for the Commission to adopt the Company's**

19     **requested capital structure?**

20  A.  Yes. One hundred percent of Carolina Water's common stock is owned by Utilities, Inc.;

21     no common stock is sold directly to the public. Since the Company only raises common

22     equity indirectly via its parent, it is reasonable to at least consider the option of using the

23     consolidated capital structure. In this case, Utilities, Inc.'s consolidated balance sheet is

3

1      dominated by regulated operations. As well, the consolidated capital structure does not

2      include an excessive amount of equity. Finally, in Carolina Water's last rate case, the

3      Commission found that imputation of Utilities, Inc.'s capital structure was appropriate.

4      [Order Ruling on Application for Increase in Rates, Docket No. 2000-207-W/S, August

5      27, 2001, p. 7] Under these circumstances, it is reasonable to again use Utilities, Inc.'s

6      consolidated capital structure.

7

8      **Q.**      **Let's turn to the Company's cost of debt. What debt rate has Carolina Water**

9           **requested?**

10      A.      The Company has requested a debt rate of 7.28%. This is the same cost of debt shown on

11           the books of Utilities, Inc.

12

13      **Q.**      **Is Utilities, Inc.'s cost of debt appropriate for this proceeding?**

14      A.      Yes. As explained by the Commission in Carolina Water's last rate case, Utilities, Inc.

15           "provides all external financing for CWS." [Id., p. 12] As well, I would note that the

16           interest rate paid by Utilities, Inc. is not excessive; it is unlikely that Carolina Water

17           would be able to raise debt capital on its own at a lower rate than this.

18

19      *Methods for Determining Cost of Equity*

20

21      **Q.**      **Let's turn to the next part of your Cost of Capital testimony. How can the cost of**

22           **equity be estimated?**

23      A.      There are at least two major approaches used to estimate the cost of equity capital which

1    have historically been used in regulatory proceedings—the comparable earnings approach

2    and the market approach. In the former approach the analyst attempts to derive the

3    utility's cost of capital from published data concerning the returns that firms earn on the

4    equity funds that have been placed at their disposal. In the latter approach, the analyst

5    attempts to calculate the rate of return that utility investors require on the equity funds

6    they place at the utility's disposal using data from securities markets.

7         Although each approach emphasizes a different aspect of economic theory, when

8    properly performed both methods attempt to measure the same concept: the cost of equity

9    capital. In practical applications, however, these two approaches can produce somewhat

10   different results, and they rely upon different data sources.

11

12   **Q.**   **Can you compare the Comparable Earnings Approach with the Market Approach?**

13   A.    Yes. As I use these terms, the comparable earnings approach is grounded in the

14        economic theory of competition in the market for goods and services, rather than the

15        market for securities. This theory suggests that the return earned by the average firm in a

16        competitive industry will tend to be equal to the opportunity cost of equity capital---the

17        return which could be earned by investing and operating in another industry while facing

18        comparable risk. To the extent this is temporarily not true, equity capital will tend to

19        flow away from the industries earning insufficient returns and into the ones earning

20        excessive returns.

21             As a result of this adjustment process, the balance will gradually shift:

22        competition will diminish in industries which lose firms and increase in industries which

23        gain firms. As firms leave the industries with insufficient returns, the remaining firms

1    will tend to earn higher returns. Conversely, increased competition in industries with

2    excessive returns will drive down returns, until they no longer exceed the opportunity

3    cost of equity capital. The same pattern of competitive forces also occurs as firms earning

4    high returns expand their capacity, and firms earning inadequate returns retrench. Over

5    time, returns tend to equilibrate towards a normal level (although some individual firms

6    may repeatedly earn more than their cost of capital, due to the presence of market power

7    or other unique attributes).

8    Consequently, the theory of competition provides a basis for determining the

9    opportunity cost of equity capital. By using the comparable earnings approach, one can

10   estimate the long-run cost of equity as being equivalent to the level of returns being

11   earned, on average, by firms throughout the economy. To the extent one is using this

12   method to estimate equity costs for a firm that faces above or below average risk, it is

13   necessary to adjust the economy-wide level of equity cost for the relevant differences in

14   risk.

15   One of the major advantages of the comparable earnings approach is its

16   simplicity. Basically, it is only necessary to determine the returns on book equity earned

17   by firms throughout the economy over one or more business cycles and use the resulting

18   observed average return as an estimate of the cost of equity. To the extent applicable, it

19   may also be necessary to adjust this average cost of equity for any differences in risk that

20   may apply to a particular context.

21

22

23

1  Q.  The comparable earnings approach, properly used, appears fairly simple. Are there

2      any pitfalls?

3  A.  Yes, there are a few potential pitfalls. First, it is important to include a cross-section of

4      companies in the study. This broader base prevents the possible selection of an unusual

5      group of firms which earn returns significantly above or below the norm. Second, care

6      must be taken to avoid the use of data from a group of firms which have a large amount

7      of monopoly power. Otherwise, the returns included in the study may be biased upward

8      to a significant degree by the presence of monopoly profits. Third, it is important to

9      resolve any differences in risk. For instance, if the firms included in the study face a

10     higher degree of risk than the firm in question, this difference must be recognized by

11     adjusting downward the observed returns to reflect the cost of equity to a firm facing

12     lower risk.

13

14 Q.  Would you next discuss the market approach?

15 A.  Yes. In contrast to the comparable earnings approach, the market approach tends to be

16     more complex, and it rests upon a somewhat different theoretical foundation. Generally

17     speaking, the market approach, when properly applied, is tied to the theory of competition

18     in the market for investment securities, instead of goods and services. In a competitive

19     market, the return earned on one security will tend to equal the returns earned on other

20     securities of comparable risk. If the return earned on a particular security exceeds the

21     level they require, investors will bid up the price of that security. By the same token,

22     investors will bid down the market price of a security if its return is below the required

23     level. In both cases, the price will be adjusted until the expected total return reaches the

1    required level, which is the cost of equity capital.

2        The market and comparable earnings approaches are interrelated, because the

3    theory of competition suggests that in equilibrium the cost of equity derived from the

4    comparable earnings approach should exceed the cost of equity derived from the market

5    approach by only a small fraction, in order to cover the transaction costs associated with

6    common stock issuance.  Only this small marginal deviation can logically persist,

7    assuming there is sufficient competition in both the securities and goods and services

8    markets.

9        To illustrate this principle, it is helpful to consider the following situation: What

10   would happen if existing firms consistently earned returns considerably higher than the

11   level demanded by investors in the securities market?  In all probability, entrepreneurs

12   would create new firms in an effort to share in the high returns enjoyed by existing firms.

13   In addition, existing firms would expand in an effort to maintain their market share and

14   take advantage of the opportunity for supra-normal profits.  To fuel this growth,

15   additional equity shares would be issued and/or profits retained.

16       In the absence of barriers to entry or other factors that preclude competitive forces

17   from being completely effective,  the universe of competing companies would grow, and

18   the supply of equity securities would expand, until the actual returns earned by firms was

19   driven down to levels that are consistent with the returns required by equity investors.

20   Accordingly, because of the interaction between the securities market and the markets for

21   goods and services, and assuming competition exists in both sets of markets,  earnings on

22   book equity should in the long run exceed the return on equity demanded by investors by

23   only the small fraction needed to cover the transaction costs associated with securities

8

1    issuances.

2

3    *Comparable Earnings Analysis*

4

5    Q.    **Would you please discuss the approach taken in your comparable earnings**

6          **analysis?**

7    A.    Certainly. To provide a sufficiently broad data base for my study of achieved returns, and

8          to avoid circular reasoning in my conclusions, I have analyzed the returns of a wide range

9          of firms in the unregulated sectors of the economy. This wide-spectrum approach

10         minimizes any bias inherent in the data, especially since I focus on the earnings of

11         unregulated firms which do not exert large amounts of monopoly power. I have not

12         assumed the achieved returns of a specific firm or group of firms to be adequate or

13         reasonable when there is evidence to the contrary. Thus, any potential circular reasoning

14         is prevented.

15         One of the major advantages of this approach, properly used, is its relative

16         simplicity. My analytical procedure can be summarized in five steps. First, I studied the

17         rates of return on average common equity earned by unregulated (primarily industrial)

18         firms. Second, on the basis of the historical earnings of these firms and an analysis of

19         current economic conditions, I estimated the current cost of equity capital to the average

20         unregulated (industrial) firm. Third, I examined the relative risk of utilities versus

21         industrials and estimated the current cost of equity for various types of utilities, including

22         water companies. Fourth, I used the latter as a benchmark in deriving the

23         comparable-earnings-based estimate of the Company's cost of equity.

9

1    **Q.**    **What conclusions have you drawn concerning the historical rate of earnings on**

2            **common book equity for industrial firms?**

3    A.    Schedules 1 and 2 of my exhibit shows the earnings on average common equity of two

4            broad and comprehensive groups. The Federal Trade Commission's "All Manufacturers"

5            group, shown on schedule 1, is a very broad-based group of industrial firms. These firms

6            earned an average return of 9.2% during the five years 2000-2004. During the five years

7            1999-2003, the returns averaged 10.6%. For the 10-year period 1995-2004, returns on

8            equity averaged 13.1%. For the 15-year period 1990-2004, returns on equity averaged

9            11.5%, and for the 20-year periods ending in 2002, 2003 and 2004 earnings averaged

10          11.9%, 11.6% and 11.5%, respectively. Finally, for the 30-year period 1975-2004,

11          earnings averaged 12.2%.

12              The analogous data for the range of industries monitored quarterly by <u>Business</u>

13          <u>Week</u> are shown on my Schedule 2. Earnings for this comprehensive group of

14          approximately 900 companies, averaged 11.8% during the 5 years 2000-2004 and 12.3%

15          during the 5 years 1999-2003. Earnings were higher during the 10-year period 1995-2004,

16          averaging 14.1%, but over the 15 year period ended in 2004 earnings averaged 13.3%,

17          and during the 20-year period 1985-2004, their earnings averaged 13.0%. Similarly, over

18          the 30 years from 1975 through 2004, the industries monitored by <u>Business Week</u> earned

19          an average annual return on equity of 13.2%.

20

21    **Q.**    **Would you explain how you used this information?**

22    A.    Certainly. I looked at changes in equity returns over the long run and during the recent

23          past, as well as current economic conditions, to estimate the current and near-future cost

1    of equity. As depicted on schedule 1, returns earned by industrial companies tend to

2    fluctuate with the business cycle--increasing during periods of expansion and falling

3    during recessions. For example, just before and slightly into the 1980 recession,

4    industrial returns peaked above 16%; they declined sharply during the subsequent

5    recession. In 1988, returns again peaked at just over 16%. They then began to fall,

6    reaching a low of 2% in 1992. Annual returns ending in the 4th quarter climbed above

7    15% for the years 1994 through 2000, then dropped below 2% in 2001. More recently,

8    returns have climbed to almost 15% for the 12 months ending in the third quarter of 2004.

9    While this data reveals that industrial returns have fluctuated quite dramatically

10   with changes in the business cycle, it also indicates that these returns have been rather

11   stable over the longer run. For example, during the 15 year period 1990-2004, the FTC

12   returns averaged 11.5%, and the analogous returns over the 20 year period from 1983

13   through 2002 averaged 11.7%.

14

15   Q.   **Is this pattern consistent with that of other industry groups you have examined?**

16   A.   Yes. As Schedule 2 indicates, Business Week tracks data for more than 900 firms in a

17   wide spectrum of industries. These equity returns also fluctuate with the business cycle;

18   average returns reached a low of 8.8% in 1991 before climbing to a high of 16.8% in

19   1996. More recently, equity returns for this group sank to a low of 5.7% in 2001, before

20   climbing to 14.7% in 2004. Long term averages for the most recent 20 year period was

21   13.0%, which is somewhat higher than the FTC group averaged over the same time

22   period.

23

11

1   Q.   What have you concluded concerning the cost of equity to industrials and other

2        unregulated firms?

3   A.   Considering the full spectrum of information concerning returns earned in the unregulated

4        sectors over the course of the business cycle, I have concluded that the average current

5        and near-future opportunity cost of equity capital to a typical unregulated firm is in the

6        neighborhood of 11.5% to 13.0%.

7

8   Q.   How does your conclusion compare with the observed results?

9   A.   My estimate range of 11.5% to 13.0% is consistent with the normal return earned by the

10       average unregulated firm over the full course of the business cycle. The low end of the

11       range is approximately equal to the 11.5% earned by the FTC "All Manufacturers" during

12       the 15 year period 1990-2004, while the high end of the range is approximately equal to

13       the 13.3% earned by the Business Week firms over this same 15-year period. The

14       midpoint of this range (12.25%) is somewhat higher than the most recent earnings of

15       these groups (which averaged 9.2% and 11.8%, respectively during the 5 years 2000-

16       2004), and it is somewhat lower than the 10-year average of these groups (which

17       averaged 13.1% and 14.1%, respectively during the 10 years 1995-2004).

18

19  Q.   Does a utility's risk differ significantly from the risk of a typical unregulated firm?

20  A.   Yes. The equity risk of the average regulated utility is far lower than that of the average

21       unregulated firm--an important fact that needs to be considered in any estimate of a

22       utility's cost of equity capital. Nevertheless, all utilities do not face the same risk. In fact,

23       significant risk differences exist between different types of utilities. For example, electric

1     utilities, which construct and maintain massive generating plants and transmission

2     facilities, must wrestle with problems of lead time, environmental impact, and financing

3     to a greater degree than water and sewer utilities and telephone companies. Electric and

4     gas distribution utilities also risk changes in the cost and availability of various fuels, and

5     most electric utilities face the additional uncertainties of environmental and nuclear

6     power regulation. While telephone utilities do not face these problems, they do face an

7     increasing degree of competition, changing regulatory and market conditions, and they

8     rely on some technologies that are subject to rapid change.

9

10   **Q.**   **How do water utilities differ from industrials and other utilities?**

11   A.   In general, water utilities are less risky than other utilities, and far less risky than the

12     typical unregulated firm. Consider first the price elasticity of demand. Some products

13     and services, like utility-supplied electricity and water, have no short-run substitutes. As

14     well, these commodities are viewed as essential by most customers. Hence, the elasticity

15     of demand for water service is extremely low, thereby reducing the equity risks faced by

16     the average local water company to a level far below that of the typical industrial firm.

17     Simply stated, life cannot exist without water. At any conceivable price--no matter how

18     high--most customers will continue to use a water utility's product, particularly in urban

19     areas where water wells and septic tanks aren't viable options. This is crucially important,

20     because it suggests that most of the risks that a water utility confronts can potentially be

21     solved, if necessary, by raising prices. For instance, changing environmental regulations

22     may lead to cost increases, but water utilities can rest assured that these cost increases

23     will ultimately be passed through and borne by their customers. The same reasoning is

1    true for local exchange carriers, gas utilities and electric utilities, but to a lesser degree.

2    The latter firms face a greater level of uncertainty about the long term consequences of

3    price increases--if cost increases, regulatory changes or other problems are sufficiently

4    severe, gas, electric and telephone utilities will start losing customers, and sales volume

5    to a greater degree than one would expect for the typical water utility.

6    Water utilities also face less risk than telephone utilities with respect to changing

7    technology and competitive inroads into portions of their markets. Local exchange

8    companies, which are historically operated as de facto monopolies in their service areas,

9    are experiencing increased competitive pressures from cellular carriers, long distance

10   carriers, competitive local exchange carriers, cable television carriers, and smaller

11   specialized telecom suppliers. In contrast, water companies continue to enjoy their local

12   monopoly positions. While one could argue they face an increasing degree of

13   competition from soft drink distributors and other purveyors of bottled water, for all

14   practical purposes their monopoly position is virtually unchallenged. Their service of

15   providing water and wastewater services via underground pipes is not easily displaced by

16   any other technology, and they do not face any serious competitive risks in most

17   communities.

18

19   Q.   What is your conclusion with respect to the level of risk facing different utilities?

20   A.   I believe all utilities tend to face lower risks than the typical unregulated firm, because the

21   services they provide are vitally important, and demand for those services tends to be

22   somewhat impervious to changes in the business cycle. Still, there are significant risk

23   differences within the utility sector. For instance, water companies serving metropolitan

1   areas are among the least risky firms in the American business world. The overall equity

2   risk of the average water and sewer utility is substantially less than that of the average

3   incumbent telephone carrier, electric utility, or gas distribution utility. Very small water

4   companies serving a narrow market face some additional risks related to economic

5   conditions and other variables that are unique to their particular service area, but like

6   other regulated firms, they face significantly less risk than the average unregulated

7   industrial firm.

8

9   Q.   Can you now discuss the risks faced by Carolina Water specifically?

10  A.   Yes. The demand for Carolina Water's primary services is strong and stable, relative to

11  the demand for the products produced by most utility or industrial firms. The latter suffer

12  great uncertainties over shifting market shares and the vicissitudes of competition.

13  Because the underlying demand for most products is not as stable as the demand for

14  utility services, the average unregulated firm--even if well managed--faces the possibility

15  of negative earnings, bankruptcy, and total extinction. No such concerns need apply to

16  Carolina Water--particularly considering the stable, conservative regulatory climate in

17  which it operates. While earnings may fluctuate a bit from year to year, there is no reason

18  to fear that the Company's earnings would drastically decline over an extended period of

19  time, nor is there reason to fear that the Commission would turn a deaf ear in the event

20  the Company were to encounter financial difficulties.

21        Like other water companies, Carolina Water faces relatively few business risks.

22  However, it is a relatively small utility, serving just 5,733 water customers and 9,779

23  waste water customers. [Ahern Direct, p. 14] The relatively small size of the Company's

1    customer base increases its risks somewhat. Fortunately, however, these customers are

2    dispersed in 11 different counties across South Carolina, rather than being concentrated in

3    a single geographic area. [Lubertozzi Direct, p. 2]  On balance, a small upward risk

4    adjustment is appropriate in estimating the Company's equity costs, relative to the average

5    large water utility, to account for the small size of Carolina Water's operations.

6

7    Q.    You have previously described your analysis of the historical returns on equity of

8          industrial firms, and your conclusions concerning the relative risk of Carolina

9          Water.  Would you now please explain your opinion concerning the cost of equity to

10         industrials and utilities?

11   A.    Yes.  As I explained earlier, I have concluded that the current and near-future opportunity

12         cost of equity capital to industrials will be in the neighborhood of 11.5% to 13.0%.

13         Factoring in the differences in overall equity risk separating industrials and these utilities,

14         my comparable earnings analysis suggests that the current and near-future cost of equity

15         to incumbent telephone carriers, electric utilities, and gas utilities fall in the range from

16         10.0% to 11.5%.

17

18   Q.    What is your best estimate of the cost of equity for water utilities?

19   A.    On balance, I believe the cost of equity to the typical local water utility is in the range of

20         9.5% to 10.5%.  This conclusion is derived from my estimate of the cost of equity to

21         unregulated firms, adjusting for differences in risk: logically, the cost of equity for water

22         companies must be substantially lower than for industrials and other unregulated firms

23         and appreciably lower than for other utilities, because of this difference in risk.

1 **Q.    What is your conclusion concerning the Company's cost of equity using the**

2    **comparable earnings approach?**

3 A.    Based upon my examination, I believe the equity risks facing the Company in its

4    operations are slightly greater than the average large water utility. In making this

5    assessment I have taken into consideration the Company's small size, its diverse

6    geographic footprint, strong financial indicators, favorable regulatory climate, and

7    conservative equity ratio.

8    I have concluded that the cost of equity to a typical unregulated industrial firm is

9    in the range of 12.5% to 13.0%, and the cost of equity to the average large water utility is

10    in the range of 9.5% to 10.5%. Considering differences in risk, it is reasonable to

11    conclude that the cost of equity to Carolina Water is slightly higher. More specifically,

12    after adjusting for differences in risk, I have estimated the Company's cost of equity using

13    the comparable earnings approach to be in the range of 10.1% to 11.1%.

14

15    *Market Analysis*

16

17 **Q.    Would you now discuss how the cost of equity is determined under the market**

18    **approach?**

19 A.    Yes. Market data are used indirectly to estimate the return requirement for equity

20    investors. This requirement, in turn, can be indirectly used as an estimate of the cost of

21    equity capital. Since the rate of return is applied to the book amount of equity

22    investment, the estimated investor return requirement should be factored up to allow for

17

1    the transaction costs of issuing stock.

2

3    Q.    **What method have you employed in your market analysis of the cost of equity?**

4    A.    My market analysis is independent of my comparable earnings analysis. In developing

5    my market analysis I used two closely related analytic processes involving data from the

6    financial markets. I developed two sets of distinct, yet closely related, calculations: I

7    observed historic market returns earned by equity investors; and, I prepared a Discounted

8    Cash Flow (DCF) analysis. My DCF analysis uses data for a group of ten water

9    companies, since Carolina Water does not issue common stock and its parent, Utilities,

10   Inc., is not publicly traded. These 10 companies were chosen because they were active

11   U.S. water utilities for which Standard and Poor's stock reports were available.

12   I believe that in performing a market analysis, especially in estimating the growth

13   component in a DCF analysis, the status of investor expectations or psychology should be

14   assessed very carefully. In my opinion, a strictly mechanical process should not be used,

15   because this considers neither the available evidence regarding investors' moods and

16   expectations nor subtle nuances such as the sustainability of particular growth rates

17   (whether achieved or projected).

18   In the broadest sense, the market approach is simply a technique for determining

19   the rate of return that investors require from a particular security. Since the supply of a

20   particular security tends to be fixed at any point, securities markets allow supply and

21   demand to match by adjusting the price to an appropriate, market-clearing rate of return.

1     Unfortunately, the market clearing return cannot be directly observed. Avoidance of

2     incorrect or misleading conclusions about investor requirements entails a close

3     examination of the securities markets and of the various psychological and economic

4     factors that influence them.

5

6  **Q.  How should factors of market psychology be taken into consideration?**

7  A.  It is sometimes necessary to decide whether investors are optimistic or pessimistic about

8     the future of the firm or firms in question. When attitudes are very negative,

9     earnings/price ratios will be above the cost of equity, and market-to-book ratios will tend

10    to be low, since the stock price is depressed by factors not fully reflected in the current

11    earnings figure.

12         Conversely, during a period of bullish speculation, or when investor attitudes are

13    particularly buoyant about the company in question, the calculated earnings/price ratio

14    will tend to be less than the actual cost of equity. In effect, investors are anticipating extra

15    earnings from their investment in the stock, beyond those reflected in the earnings per

16    share.

17

18 **Q.  Let's discuss your first set of calculations under the market approach. What**

19    **historical levels of achieved market returns have you observed?**

20 A.  I began my analysis with a review of total returns for the S&P 500, as reported by

21    Ibbotson Associates in its annual *Stocks, Bonds, Bills and Inflation Yearbook*. For 1926

1    to 1976, these total returns were calculated by summing the return from capital

2    appreciation return and from income (dividends) for this group of stocks. The capital

3    appreciation return is measured as the change in the S&P 90 stock index from 1926 to

4    March 1957, and the S&P 500 stock index from 1958 to 1976. According to the

5    explanation provided by Ibbotson Associates, the income return was calculated by

6    extracting quarterly dividends from rolling year dividends reported quarterly in S&P's

7    *Trade and Securities Statistics*, then allocated to months within each quarter using

8    proportions taken from the 1974 actual distribution of monthly dividends within quarters.

9    After 1976, total returns were provided to Ibbotson Associates by the National Bank and

10    Trust Company of Chicago.

11          Schedule 3 shows total returns from 1926 to 2004 for these large company stocks,

12    as reported by Ibbotson. This 78-year period covers many business cycles and stock

13    market cycles; therefore, dramatic fluctuations in earned returns occur throughout the

14    series. These wide fluctuations can have a profound effect upon the observed returns that

15    can be calculated from any given series of stock market data for any particular time

16    period. For example, for the period 1929 to 1932, total annual returns averaged -21.2%

17    On the other hand, from 1933 to 1936, returns averaged 33.4%.

18          Clearly, investors do not expect to earn extremely low returns, and they do not

19    require extremely high returns. Yet, long stretches of inordinately high or low returns do

20    occur. During some time periods, investors are unusually lucky, or they benefit from

21    "irrational exuberance" while during other periods they are unusually unlucky, or they

1    suffer the effects of undue pessimism. The resulting fluctuations in returns are a key

2    source of controversy and difficulty in carrying out the market approach.

3         Fortunately, a measure of central tendency can be observed if one looks at a long

4    enough data series, or if one focuses on a time period which include a balanced mixture

5    of bear and bull markets. For instance, returns averaged 12.5% over the entire 78-year

6    period. In my opinion, this long term average provides a reasonable estimate of the cost

7    of equity for large company stocks.

8

9    Q.   **Have you performed any additional calculations that tend to corroborate this very**

10        **long term measure of equity costs?**

11   A.   Yes. On Page 2 of schedule 3 I present the average returns over the 30, 25, 20, 15, 10 and

12        5 year periods ending in 2004. This series of recent time periods is dominated by the long

13        bull market which ended a few years ago. The more recent years have been much less

14        bullish, and thus returns have been lower (or negative) in the recent past. As a result of

15        this corrective period, the overall average of the returns earned by investors during these

16        recent time periods tends to corroborate, to some degree, the very long term average

17        results. For instance, averaging returns for the 30, 25, 20, 15, 10, and 5-year time periods

18        ending in 2004, I computed an overall average of 11.6%.

19        Similarly, over the 30-year period from 1946 through 1975, returns averaged

20        11.7%. Over the 30-year period ending in 1976, returns averaged 12.7%. Over the 30-year

21        period ending in 1977, returns averaged 12.3%. Following the same procedure for all of

21

1    the years up to and including the 30-year period ending in 2004, the overall cumulative

2    average return is 12.3%, as shown in the bottom right hand corner of page 2 of Schedule

3    5. This averaging technique considers all of the data from the entire post-World War II

4    period, but it places greater emphasis on more recent years.

5          Applying this same technique to the 10 year period from 1966 through 1975, the

6    10-year period ending in 1976, the 10-year period ending in 1977, and so forth, to and

7    including the 10-year period ending in 2004, the overall cumulative average return is

8    13.6%. Similar averages have occurred over various other time periods, as well, as

9    shown in the matrix of results displayed on Page 2 of Schedule 5. This data suggests that

10   over long periods of time, the return required (and expected) by equity investors in the

11   average large unregulated company (the types of firms included in this data series) is

12   somewhere in the neighborhood of 12.5%, although it is difficult to pinpoint a precise

13   figure, because actual returns fluctuate so widely.

14

15   Q.   Would you please briefly summarize the Discounted Cash Flow analysis you

16        performed in arriving at this conclusion?

17   A.   Yes. I concluded that estimate investors in the 10 water utilities require on average a

18        return of approximately 8.5% to 9.8%, composed of a dividend yield of 3.0% to 3.3% and

19        a long term future growth rate of 5.5 to 6.5%. This 3.0% to 3.3% dividend yield is

20        consistent with the recent historic range of yields for these companies' stocks, placing the

21        greatest emphasis on the yields experienced during the first few months of 2005. This

22        yield is currently satisfactory to investors, given their current growth expectations, low

1        returns available from money market instruments and other investment alternatives, and

2        current attitudes about future growth potential for these firms.

3

4    Q.    **Let's discuss your DCF analysis in detail. Would you please begin with a brief**

5        **overview of recent dividend yields for the 10 water utilities?**

6    A.    Yes. As shown on Schedule 4, the average dividend/price ratio (yield) for the 10 water

7        companies have declined in recent years, moving from a high of 6.0% in 1995 to a low of

8        3.1% in 2003. Yields averaged 3.2% for the 3 year period 2001-2003, and 3.4% during

9        2000-2002. Yields for these 10 companies averaged 3.3% for the 5 year period 1999-

10       2003, and 3.5% for the five year period ending in 2002. During the first few months of

11       2005, these companies had an average dividend yield of approximately 2.9 to 3.1%. After

12       evaluating this data, I selected a dividend yield of 3.0% - 3.3% for my DCF analysis.

13

14    Q.   **Could you now discuss the growth rate you used in your DCF analysis?**

15    A.   Yes. Since growth is a multidimensional phenomenon, no single variable proves

16       adequate in describing a firm's growth, or investor expectations concerning that growth.

17       The historical growth statistics vary widely, depending upon the type of growth measured

18       and the period chosen. Therefore, I have examined the historical pattern of growth in

19       dividends, earnings, and book value for these 10 water utilities.

20           During the five-year periods shown on schedule 5, average annual dividend

21       growth ranged from 3.3% during 1997-2001 to 4.3% during 1998-2002. For the seven-

22       year periods shown on schedule 5, dividend growth rates ranged from 4.0% to 4.1%.

23       Some would argue that historic growth in dividends is the best single indicator of future

1    growth in dividends. While there is some merit to this view, historic dividend growth is

2    not always a good indicator of future dividend growth, particularly over the very long

3    term, which is what is used in a DCF analysis. Firms are not under any compulsion to pay

4    out any particular portion of their earnings. To the contrary, they are free to modify the

5    pace at which they increase their dividends, although they may be compelled to reduce

6    dividends if earnings are not sufficient to support the dividend. As shown on Schedule 5,

7    from 2001-2003, dividends for the 10 water companies grew by an annual average of

8    6.0%. This reflected an increase from earlier years. From 2000-2002 and from 1999-

9    2001, dividends grew by an annual average of just 3.9% and 2.5%, respectively.

10    Overall, the five and seven year average growth rates fall within a range from

11    about 2.5% to 4.1%. However, investors don't simply look at the historical rate of

12    dividend growth in valuing stocks. To the contrary, investors recognize that growth is a

13    dynamic process, which responds to changes in industry conditions, and the underlying

14    financial health of each firm. In particular, investors realize that a firm with a low

15    dividend payout and low rate of dividend growth is reinvesting a large portion of its

16    earnings in the firm, and this should ultimately benefit investors through increased

17    earnings, higher stock prices, and (perhaps) higher dividends in future years.

18    Accordingly, it is useful to study earnings growth rates, despite the fact that

19    earnings data often reflects a much wider range of fluctuation. As shown on schedule 6,

20    from 2001-2003, earnings for the 10 water companies declined by an annual average of

21    3.0%; recall that this was the same recent period when dividends were growing at 6.0%.

22    Needless to say, this discrepancy between earnings and dividend growth cannot continue

23    into the long term future. Over the five year period from 1999-2003, earnings declined by

24

1    just 0.8%. During the immediate prior five year period (1998-2002) earnings grew by

2    2.7%. During 1997-2001, earnings grew by an average annual rate of 5.5%. Due to weak

3    earnings during 2003, earnings growth during the seven-year periods shown on Schedule

4    6 also fluctuate widely, ranging from 1.9% to 6.7%.

5

6    **Q.    Have you examined other data which can help reconcile these discrepancies?**

7    A.    Yes. I examined growth in book value for the 10 water utilities. Book value is an

8    important indicator of the fundamental earnings power and value of a regulated firm. As

9    shown on schedule 7, for the 3-year period 2001-2003, book value grew by an average

10    annual rate of 9.7%. For the 3-year period 2000-2002, book value grew by an average

11    rate of 1.4%. However, for the 3-year period 1991-2001, and for all of the 5-year periods

12    shown on schedule 7, average annual book value growth ranged from 5.9% to 7.1% for

13    these 10 water companies. During the 7-year periods shown on schedule 7, book values

14    grew at an average page of 5.9% to 7.1%.

15

16    **Q.    Did you take investors' future expectations into consideration in developing your**

17    **growth rate estimate?**

18    A.    Yes, I did. I used a long term growth rate of 5.5% to 6.5% in my DCF analysis, despite

19    the fact that these firms' dividends have grown at a rate of just 4.0% during the five year

20    period 1999-2003 and 4.1% during the seven year period 1997-2003.

21          The growth rate I used in my DCF analysis encompasses the rapid 6.0% growth in

22    dividends which was experienced from 2001 to 2003, as well as the 5.5% growth in

23    earnings which was experienced during 1997-2001. However, it is higher than most of the

1       dividend and earnings growth rates displayed on Schedules 5 and 6, respectively.

2               The growth rate range of 5.5% to 6.5% I used in my DCF analysis is generally

3       consistent with the average growth in book value which was experienced by these 10

4       water companies from 1995 through 2003. Growth in book value is significant in this

5       context, because book value closely tracks the underlying growth in equity capital per

6       share (primarily due to reinvested earnings), and therefore it provides an indicator of the

7       long term prospects for both earnings and dividends. As well, in the case of rate base

8       regulated companies, book value is conceptually related to the process used in developing

9       a firm's revenue requirements, and thus growth in book value is an indicator of the firm's

10      long term future earnings and dividend growth potential. The 5.5% to 6.5% growth range

11      I used in my DCF analysis falls between the 9.7% book value growth rate experienced

12      during 2001-2003 and the 1.4% growth rate experienced during 2000-2002. It is

13      somewhat lower than the average rate of growth in book value during 1997-2003 of

14      7.1%, but it encompasses the corresponding growth rates during 1997-2002 (6.3%) and

15      1996-2002 (6.2%).

16              In general, it is fair to say that the growth range I selected for use in my DCF

17      analysis is consistent with, but somewhat higher than, the average historic growth rates

18      experienced by the 10 water companies during 1995-2003. While this may seem

19      anomalous, it is investor *expectations* about the future, not past results, that are most

20      relevant in developing a DCF analysis. In my opinion, a 5.5% to 6.5% growth rate fairly

21      reflects the average investor's expectations for long term dividend growth for these 10

22      water companies, despite the fact that this range is somewhat higher than much of the

23      recent historic growth data.

1    **Q.**    **What conclusions have you drawn from your market analysis regarding the**

2          **appropriate cost of equity capital for use in this proceeding?**

3    **A.**    I have reached the conclusion that the Company's cost of equity falls within a range from

4          9.5% to 10.8%. This conclusion reflects my analysis of the full spectrum of market data

5          discussed above, but I primarily relied on my discounted cash flow analysis of investors'

6          required returns for the 10 water utilities.

7

8    **Q.**    **Can you explain how you reached a final conclusion concerning the Company's cost**

9          **of equity based on the market method?**

10    **A.**    Yes. First, as noted earlier, I estimated investor return requirements for the 10 water

11          companies to be 8.5% to 9.8%. Second, I factored this estimate up by 4.0%, to cover the

12          cost of issuing stock - an allowance I made rather generously, by applying it to the entire

13          equity amount, even though issuance costs are not incurred for total equity (e.g., not for

14          reinvested earnings). Second, I made an upward adjustment of .6% to account for the

15          relatively small size of the Company's service territory in South Carolina. This size

16          discrepancy translates into somewhat higher risk for the Company compared to the 10

17          publicly held water companies, due to its lack of geographic and economic diversity.

18          While I don't necessarily agree with the approach used by Mrs. Ahern in developing her

19          "Investment Risk Adjustment" [See, Ahern Direct, p. 58], I would note that her

20          recommended adjustment has a similar magnitude to mine, and it serves much the same

21          purpose. Needless to say, it would not be appropriate to apply her adjustment to my

22          results, or to make any further upward adjustment beyond the ones I have adopted. The

23          combined effect of my two upward adjustments is an estimate of the Company's cost of

1    equity, using the market approach, of 9.5% to 10.80%.

2

3    *Conclusions and Recommendations*

4

5    Q.    Let's turn to the last section of your testimony.  Would you please summarize your

6          recommendations?   You have derived different estimates of the Company's cost of

7          equity by using comparable earnings and market approaches.   Is this inconsistent?

8    A.    No.  It is not inconsistent, because I have derived these estimates by methods that are

9          theoretically and practically distinct.  It would be unrealistic to expect identical results

10         from the market and comparable earnings approaches, considering the differences

11         between them.  Nevertheless, the independent application of the two methods has resulted

12         in reasonably similar conclusions: 10.1% to 11.1% under the comparable earnings

13         approach, and 9.5% to 10.8% under the market approach.

14

15   Q.    Does this conclude your direct testimony, which was prefiled on April 20, 2005?

16   A.    Yes.

# DIRECT EXHIBITS

# OF

# DR. BEN JOHNSON

## DOCKET NO. 2004-357-W/S
## APPLICATION OF
## CAROLINA WATER SERVICE, INC.
## FOR ADJUSTMENT OF
## RATES AND CHARGES

# Return on Common Equity: Federal Trade Commission

*All Manufacturing Corporations*

| Year Ended | Quarterly Moving Averages | | | |
| | First Quarter | Second Quarter | Third Quarter | Fourth Quarter |
| --- | --- | --- | --- | --- |
| 1975 | 13.58% | 12.35% | 11.60% | 11.58% |
| 1976 | 12.65% | 13.63% | 13.95% | 13.95% |
| 1977 | 13.88% | 13.95% | 13.85% | 14.18% |
| 1978 | 14.03% | 14.18% | 14.58% | 15.00% |
| 1979 | 15.83% | 16.20% | 16.55% | 16.45% |
| 1980 | 16.38% | 15.25% | 14.30% | 13.88% |
| 1981 | 13.43% | 13.93% | 14.15% | 13.65% |
| 1982 | 12.78% | 11.50% | 10.45% | 9.25% |
| 1983 | 8.70% | 8.80% | 9.33% | 10.50% |
| 1984 | 11.65% | 12.55% | 12.70% | 12.48% |
| 1985 | 11.98% | 11.08% | 10.58% | 10.15% |
| 1986 | 9.78% | 10.10% | 9.73% | 9.53% |
| 1987 | 10.08% | 10.58% | 12.13% | 12.85% |
| 1988 | 14.00% | 14.80% | 15.13% | 16.08% |
| 1989 | 15.93% | 15.23% | 14.55% | 13.53% |
| 1990 | 12.43% | 12.13% | 11.60% | 10.58% |
| 1991 | 9.60% | 8.40% | 7.25% | 6.28% |
| 1992 | 0.18% | 0.88% | 1.85% | 2.00% |
| 1993 | 7.45% | 7.03% | 6.80% | 8.00% |
| 1994 | 10.20% | 12.03% | 13.80% | 15.73% |
| 1995 | 16.80% | 17.18% | 17.03% | 16.03% |
| 1996 | 15.58% | 15.38% | 15.95% | 16.68% |
| 1997 | 17.03% | 17.15% | 16.78% | 16.63% |
| 1998 | 17.38% | 16.55% | 16.48% | 15.80% |
| 1999 | 14.78% | 15.60% | 15.65% | 16.48% |
| 2000 | 17.00% | 16.75% | 16.50% | 15.00% |
| 2001 | 10.50% | 7.50% | 4.03% | 1.93% |
| 2002 | 3.45% | 4.70% | 6.45% | 7.63% |
| 2003 | 9.25% | 9.68% | 10.18% | 12.13% |
| 2004 | 12.48% | 13.68% | 14.93% | |

Sources: FTC and U.S. Census Bureau,Quarterly Financial Report for Manufacturing, Mining,
& Trade Corporations,1948-Present

# Return on Common Equity: Federal Trade Commission

*All Manufacturing Corporations*

| Period | Quarterly Moving Averages | | | |
| --- | --- | --- | --- | --- |
| | First Quarter | Second Quarter | Third Quarter | Fourth Quarter |
| *30-year moving averages* | | | | |
| 1975-04 | 12.3% | 12.3% | 12.3% | 12.2% |
| *20-year moving averages* | | | | |
| 1983-02 | 11.7% | 11.7% | 11.7% | 11.7% |
| 1984-03 | 11.8% | 11.8% | 11.8% | 11.8% |
| 1985-04 | 11.8% | 11.8% | 11.9% | 11.7% |
| *15-year moving averages* | | | | |
| 1988-02 | 12.2% | 12.1% | 12.0% | 11.9% |
| 1989-03 | 11.8% | 11.7% | 11.7% | 11.6% |
| 1990-04 | 11.6% | 11.6% | 11.7% | 11.5% |
| *10-year moving averages* | | | | |
| 1993-02 | 13.0% | 13.0% | 12.9% | 13.0% |
| 1994-03 | 13.2% | 13.3% | 13.3% | 13.4% |
| 1995-04 | 13.4% | 13.4% | 13.4% | 13.1% |
| *5-year moving averages* | | | | |
| 1998-02 | 12.6% | 12.2% | 11.8% | 11.4% |
| 1999-03 | 11.0% | 10.8% | 10.6% | 10.6% |
| 2000-04 | 10.5% | 10.5% | 10.4% | 9.2% |

Sources: FTC and U.S. Census Bureau,Quarterly Financial Report for Manufacturing, Mining,
& Trade Corporations,1948-Present

# Return on Common Equity: Business Week

*All Industry Composite*

| Year Ended | First Quarter | Second Quarter | Third Quarter | Fourth Quarter |
|---|---|---|---|---|
| 1975 | 13.4% | 12.6% | 12.0% | 11.8% |
| 1976 | 13.0% | 13.2% | 13.7% | 14.0% |
| 1977 | 13.6% | 14.1% | 14.1% | 14.1% |
| 1978 | 14.1% | 14.3% | 14.7% | 15.1% |
| 1979 | 16.0% | 16.3% | 16.5% | 16.6% |
| 1980 | 17.0% | 15.9% | 15.4% | 15.3% |
| 1981 | 14.8% | 15.2% | 15.2% | 14.0% |
| 1982 | 13.5% | 12.5% | 11.9% | 11.0% |
| 1983 | 10.7% | 10.6% | 10.8% | 11.5% |
| 1984 | 12.4% | 13.3% | 13.5% | 13.2% |
| 1985 | 13.1% | 12.2% | 11.8% | 11.2% |
| 1986 | 11.0% | 10.6% | 10.9% | 10.4% |
| 1987 | 11.0% | 10.4% | 10.9% | 11.6% |
| 1988 | 12.2% | 14.1% | 14.6% | 14.8% |
| 1989 | 15.5% | 15.8% | 14.5% | 13.2% |
| 1990 | 12.9% | 12.5% | 11.3% | 11.7% |
| 1991 | 11.5% | 10.3% | 9.8% | 8.8% |
| 1992 | 8.8% | 9.7% | 9.8% | 10.0% |
| 1993 | 11.4% | 11.4% | 12.1% | 11.9% |
| 1994 | 12.5% | 13.6% | 14.4% | 15.9% |
| 1995 | 16.9% | 17.1% | 17.0% | 16.3% |
| 1996 | 16.3% | 16.2% | 16.0% | 16.8% |
| 1997 | 17.4% | 16.9% | 16.8% | 16.5% |
| 1998 | 16.8% | 16.1% | 15.5% | 15.3% |
| 1999 | 14.6% | 15.2% | 15.2% | 17.1% |
| 2000 | 16.7% | 16.7% | 15.7% | 15.8% |
| 2001 | 12.7% | 10.6% | 7.5% | 5.7% |
| 2002 | 7.9% | 8.4% | 8.8% | 8.9% |
| 2003 | 9.8% | 10.9% | 11.4% | 14.0% |
| 2004 | 14.1% | 14.4% | 14.3% | 14.7% |

Source: Business Week, Corporate Scoreboard, May 1975 - February 2005

# Return on Common Equity: Business Week

*All Manufacturing Corporations*

| Period | First Quarter | Second Quarter | Third Quarter | Fourth Quarter |
|---|---|---|---|---|
| *30-year moving averages* | | | | |
| 1975-04 | 13.4% | 13.4% | 13.2% | 13.2% |
| | | | | |
| *20-year moving averages* | | | | |
| 1983-02 | 13.1% | 13.1% | 12.8% | 12.8% |
| 1984-03 | 13.1% | 13.1% | 12.9% | 13.0% |
| 1985-04 | 13.2% | 13.2% | 12.9% | 13.0% |
| | | | | |
| *15-year moving averages* | | | | |
| 1988-02 | 13.6% | 13.6% | 13.3% | 13.2% |
| 1989-03 | 13.4% | 13.4% | 13.1% | 13.2% |
| 1990-04 | 13.4% | 13.3% | 13.0% | 13.3% |
| | | | | |
| *10-year moving averages* | | | | |
| 1993-02 | 14.3% | 14.2% | 13.9% | 14.0% |
| 1994-03 | 14.2% | 14.2% | 13.8% | 14.2% |
| 1995-04 | 14.3% | 14.3% | 13.8% | 14.1% |
| | | | | |
| *5-year moving averages* | | | | |
| 1998-02 | 13.7% | 13.4% | 12.5% | 12.6% |
| 1999-03 | 12.3% | 12.4% | 11.7% | 12.3% |
| 2000-04 | 12.2% | 12.2% | 11.5% | 11.8% |

Source: Business Week, Corporate Scoreboard, May 1975 - February 2005

# Market Returns: Large Companies

| Year | Returns | Year | Returns |
|------|---------|------|---------|
| 1926 | 11.6% | 1965 | 12.5% |
| 1927 | 37.5% | 1966 | -10.1% |
| 1928 | 43.6% | 1967 | 24.0% |
| 1929 | -8.4% | 1968 | 11.1% |
| 1930 | -24.9% | 1969 | -8.5% |
| 1931 | -43.3% | 1970 | 4.0% |
| 1932 | -8.2% | 1971 | 14.3% |
| 1933 | 53.4% | 1972 | 19.0% |
| 1934 | -1.4% | 1973 | -14.7% |
| 1935 | 47.7% | 1974 | -26.5% |
| 1936 | 33.9% | 1975 | 37.2% |
| 1937 | -35.0% | 1976 | 23.8% |
| 1938 | 31.1% | 1977 | -7.2% |
| 1939 | -0.4% | 1978 | 6.6% |
| 1940 | -9.8% | 1979 | 18.4% |
| 1941 | -11.6% | 1980 | 32.4% |
| 1942 | 20.3% | 1981 | -4.9% |
| 1943 | 25.9% | 1982 | 21.4% |
| 1944 | 19.8% | 1983 | 22.5% |
| 1945 | 36.4% | 1984 | 6.3% |
| 1946 | -8.1% | 1985 | 32.2% |
| 1947 | 5.7% | 1986 | 18.5% |
| 1948 | 5.5% | 1987 | 5.2% |
| 1949 | 18.8% | 1988 | 16.8% |
| 1950 | 31.7% | 1989 | 31.5% |
| 1951 | 24.0% | 1990 | -3.2% |
| 1952 | 18.4% | 1991 | 30.6% |
| 1953 | -1.0% | 1992 | 7.7% |
| 1954 | 52.6% | 1993 | 10.0% |
| 1955 | 31.6% | 1994 | 1.3% |
| 1956 | 6.6% | 1995 | 37.4% |
| 1957 | -10.8% | 1996 | 23.1% |
| 1958 | 43.4% | 1997 | 33.4% |
| 1959 | 12.0% | 1998 | 28.6% |
| 1960 | 0.5% | 1999 | 21.0% |
| 1961 | 26.9% | 2000 | -9.1% |
| 1962 | -8.7% | 2001 | -11.9% |
| 1963 | 22.8% | 2002 | -22.1% |
| 1964 | 16.5% | 2003 | 28.7% |
| | | 2004 | 10.9% |

Source: Ibbotson Associates, Stocks Bonds Bills and Inflation, Annual Yearbook

## Market Returns: Moving Averages

| Year/Period | 5 Year Average | 10 Year Average | 15 Year Average | 20 Year Average | 25 Year Average | 30 Year Average |
|---|---|---|---|---|---|---|
| 1970 | 4.1% | 9.0% | 9.5% | 13.4% | 12.8% | 13.7% |
| 1971 | 9.0% | 7.8% | 10.0% | 12.9% | 13.7% | 14.6% |
| 1972 | 8.0% | 10.6% | 12.0% | 12.9% | 14.3% | 14.6% |
| 1973 | 2.8% | 6.8% | 8.1% | 12.2% | 13.5% | 13.2% |
| 1974 | -0.8% | 2.5% | 5.5% | 8.3% | 11.7% | 11.7% |
| 1975 | 5.9% | 5.0% | 8.0% | 8.6% | 11.9% | 11.7% |
| 1976 | 7.8% | 8.4% | 7.8% | 9.4% | 11.9% | 12.7% |
| 1977 | 2.5% | 5.3% | 7.9% | 9.6% | 10.8% | 12.3% |
| 1978 | 6.8% | 4.8% | 6.8% | 7.8% | 11.1% | 12.4% |
| 1979 | 15.8% | 7.5% | 6.9% | 8.1% | 9.8% | 12.3% |
| 1980 | 14.8% | 10.3% | 8.3% | 9.7% | 9.8% | 12.4% |
| 1981 | 9.1% | 8.4% | 8.6% | 8.1% | 9.4% | 11.4% |
| 1982 | 14.8% | 8.7% | 8.4% | 9.6% | 10.6% | 11.5% |
| 1983 | 18.0% | 12.4% | 9.2% | 9.6% | 9.8% | 12.3% |
| 1984 | 15.5% | 15.7% | 10.2% | 9.1% | 9.6% | 10.7% |
| 1985 | 15.5% | 15.2% | 12.1% | 10.1% | 10.9% | 10.8% |
| 1986 | 20.2% | 14.6% | 12.3% | 11.5% | 10.5% | 11.2% |
| 1987 | 16.9% | 15.9% | 11.4% | 10.6% | 11.1% | 11.7% |
| 1988 | 15.8% | 16.9% | 13.5% | 10.8% | 10.8% | 10.8% |
| 1989 | 20.8% | 18.2% | 17.4% | 12.8% | 11.4% | 11.5% |
| 1990 | 13.8% | 14.6% | 14.7% | 12.5% | 10.8% | 11.3% |
| 1991 | 16.2% | 18.2% | 15.1% | 13.3% | 12.4% | 11.5% |
| 1992 | 16.7% | 16.8% | 16.1% | 12.7% | 11.8% | 12.0% |
| 1993 | 15.3% | 15.5% | 16.4% | 14.0% | 11.7% | 11.6% |
| 1994 | 9.3% | 15.1% | 15.2% | 15.4% | 12.1% | 11.1% |
| 1995 | 17.4% | 15.6% | 15.5% | 15.4% | 13.5% | 11.9% |
| 1996 | 15.9% | 16.0% | 17.4% | 15.3% | 13.8% | 13.0% |
| 1997 | 21.0% | 18.9% | 18.2% | 17.4% | 14.4% | 13.3% |
| 1998 | 24.8% | 20.0% | 18.6% | 18.5% | 16.1% | 13.9% |
| 1999 | 28.7% | 19.0% | 19.6% | 18.6% | 18.0% | 14.9% |
| 2000 | 19.4% | 18.4% | 16.8% | 16.5% | 16.2% | 14.5% |
| 2001 | 12.4% | 14.1% | 14.8% | 16.2% | 14.7% | 13.6% |
| 2002 | 1.3% | 11.2% | 13.0% | 14.0% | 14.1% | 12.2% |
| 2003 | 1.3% | 13.0% | 13.8% | 14.3% | 15.0% | 13.7% |
| 2004 | -0.7% | 14.0% | 12.4% | 14.5% | 14.7% | 14.9% |

| *Cumulative Averages* | | | | | | |
|---|---|---|---|---|---|---|
| 1971-2000 | 13.9% | 12.8% | 12.3% | 12.0% | 12.1% | 12.3% |
| 1972-2001 | 14.0% | 13.0% | 12.4% | 12.1% | 12.1% | 12.3% |
| 1973-2002 | 13.8% | 13.0% | 12.5% | 12.2% | 12.1% | 12.2% |
| 1974-2003 | 13.8% | 13.2% | 12.7% | 12.2% | 12.2% | 12.2% |
| 1975-2004 | 13.8% | 13.6% | 12.9% | 12.5% | 12.3% | 12.3% |

Source: Ibbotson Associates, Stocks Bonds Bills and Inflation, Annual Yearbook

# Dividend Yield

*10 Water Companies*

| Year/Period | Artesian | American States | CWS | California Water | Middlesex Water | Pennichuck |
|---|---|---|---|---|---|---|
| 1995 | NA | 6.5% | 6.6% | 6.3% | 6.4% | NA |
| 1996 | 5.8% | 5.7% | 6.5% | 5.5% | 6.3% | NA |
| 1997 | 5.2% | 5.4% | 5.6% | 4.4% | 5.8% | NA |
| 1998 | 4.1% | 5.0% | 4.8% | 3.9% | 5.2% | 4.1% |
| 1999 | 4.0% | 4.1% | 4.2% | 4.0% | 3.9% | 3.3% |
| 2000 | 4.2% | 4.1% | 4.0% | 4.2% | 4.1% | 3.7% |
| 2001 | 4.1% | 3.8% | 3.1% | 4.4% | 3.7% | 3.3% |
| 2002 | 3.9% | 3.5% | 3.1% | 4.7% | 3.7% | 2.9% |
| 2003 | 3.2% | 3.5% | 3.1% | 4.1% | 3.5% | 3.0% |
| | | | | | | |
| *5-year moving averages* | | | | | | |
| 1997-01 | 4.3% | 4.5% | 4.3% | 4.2% | 4.5% | NA |
| 1998-02 | 4.1% | 4.1% | 3.8% | 4.2% | 4.1% | 3.4% |
| 1999-03 | 3.9% | 3.8% | 3.5% | 4.3% | 3.8% | 3.2% |
| | | | | | | |
| *3-year moving averages* | | | | | | |
| 1999-01 | 4.1% | 4.0% | 3.8% | 4.2% | 3.9% | 3.4% |
| 2000-02 | 4.1% | 3.8% | 3.4% | 4.4% | 3.9% | 3.3% |
| 2001-03 | 3.7% | 3.6% | 3.1% | 4.4% | 3.7% | 3.1% |

Source: Standard & Poor's, Quantitative Stock Reports

# Dividend Yield

*10 Water Companies*

| Year/Period | SJW | Southwest | Aqua | York | 10 Company Average |
|---|---|---|---|---|---|
| 1995 | 6.3% | 4.3% | 5.8% | NA | 6.0% |
| 1996 | 5.5% | 3.0% | 4.7% | NA | 5.4% |
| 1997 | 4.3% | 2.5% | 3.7% | NA | 4.6% |
| 1998 | 3.9% | 2.1% | 2.7% | NA | 4.0% |
| 1999 | 2.7% | 1.6% | 2.8% | NA | 3.4% |
| 2000 | 2.3% | 1.9% | 3.0% | 5.7% | 3.7% |
| 2001 | 2.9% | 1.7% | 1.7% | 4.2% | 3.3% |
| 2002 | 3.3% | 1.5% | 2.6% | 3.2% | 3.3% |
| 2003 | 3.5% | 1.7% | 2.4% | 3.2% | 3.1% |
| *5-year moving averages* | | | | | |
| 1997-01 | 3.2% | 2.0% | 2.8% | NA | 3.7% |
| 1998-02 | 3.0% | 1.8% | 2.6% | NA | 3.5% |
| 1999-03 | 2.9% | 1.7% | 2.5% | NA | 3.3% |
| *3-year moving averages* | | | | | |
| 1999-01 | 2.6% | 1.7% | 2.5% | NA | 3.4% |
| 2000-02 | 2.8% | 1.7% | 2.5% | 4.4% | 3.4% |
| 2001-03 | 3.3% | 1.6% | 2.3% | 3.5% | 3.2% |

Source: Standard & Poor's, Quantitative Stock Reports

## Dividend Growth

*10 Water Companies*

| Year/Period | | Artesian | | American States | | CWS | | California Water | | Middlesex Water | | Pennichuck |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | $ | 0.42 | $ | 0.80 | $ | 0.75 | $ | 0.54 | $ | 1.02 | $ | 0.46 |
| 1996 | | 0.60 | | 0.82 | | 0.76 | | 0.55 | | 1.04 | | 0.52 |
| 1997 | | 0.61 | | 0.83 | | 0.77 | | 0.56 | | 1.05 | | 0.53 |
| 1998 | | 0.65 | | 0.84 | | 0.77 | | 0.58 | | 1.07 | | 0.59 |
| 1999 | | 0.71 | | 0.85 | | 0.79 | | 0.59 | | 1.09 | | 0.69 |
| 2000 | | 0.73 | | 0.86 | | 0.80 | | 0.61 | | 1.10 | | 0.73 |
| 2001 | | 0.74 | | 0.87 | | 0.80 | | 0.62 | | 1.12 | | 0.76 |
| 2002 | | 0.77 | | 0.87 | | 0.81 | | 0.63 | | 1.12 | | 0.81 |
| 2003 | | 0.80 | | 0.88 | | 0.83 | | 0.65 | | 1.12 | | 0.84 |

*Annualized Growth Rates*

| Year/Period | Artesian | American States | CWS | California Water | Middlesex Water | Pennichuck |
|---|---|---|---|---|---|---|
| 1995-01 | 9.9% | 1.4% | 1.1% | 2.3% | 1.6% | 8.7% |
| 1996-02 | 4.2% | 1.0% | 1.1% | 2.3% | 1.2% | 7.7% |
| 1997-03 | 4.6% | 1.0% | 1.3% | 2.5% | 1.1% | 8.0% |
| | | | | | | |
| 1997-01 | 4.9% | 1.2% | 1.0% | 2.6% | 1.6% | 9.4% |
| 1998-02 | 4.3% | 0.9% | 1.3% | 2.1% | 1.1% | 8.2% |
| 1999-03 | 3.0% | 0.9% | 1.2% | 2.5% | 0.7% | 5.0% |
| | | | | | | |
| 1999-01 | 2.1% | 1.2% | 0.6% | 2.5% | 1.4% | 4.9% |
| 2000-02 | 2.7% | 0.6% | 0.6% | 1.6% | 0.9% | 5.3% |
| 2001-03 | 4.0% | 0.6% | 1.9% | 2.4% | 0.0% | 5.1% |

Source: Standard & Poor's, Quantitative Stock Reports

# Dividend Growth

*10 Water Companies*

| Year/Period | | SJW | Southwest | Aqua | York | | 10 Company Average |
|---|---|---|---|---|---|---|---|
| 1995 | $ | 0.72 $ | 0.08 $ | 0.29 $ | 0.45 | $ | 0.55 |
| 1996 | | 0.74 | 0.09 | 0.30 | 0.45 | | 0.59 |
| 1997 | | 0.76 | 0.10 | 0.32 | 0.46 | | 0.60 |
| 1998 | | 0.78 | 0.10 | 0.34 | 0.47 | | 0.62 |
| 1999 | | 0.80 | 0.11 | 0.36 | 0.47 | | 0.65 |
| 2000 | | 0.82 | 0.13 | 0.37 | 0.49 | | 0.66 |
| 2001 | | 0.86 | 0.15 | 0.28 | 0.50 | | 0.67 |
| 2002 | | 0.92 | 0.16 | 0.43 | 0.52 | | 0.70 |
| 2003 | | 0.97 | 0.17 | 0.46 | 0.55 | | 0.73 |
| | | | | | | | |
| *Annualized Growth Rates* | | | | | | | |
| 1995-01 | | 3.0% | 11.0% | -0.6% | 1.8% | | 4.0% |
| 1996-02 | | 3.7% | 10.1% | 6.2% | 2.4% | | 4.0% |
| 1997-03 | | 4.2% | 9.2% | 6.2% | 3.0% | | 4.1% |
| | | | | | | | |
| 1997-01 | | 3.1% | 10.7% | -3.3% | 2.1% | | 3.3% |
| 1998-02 | | 4.2% | 12.5% | 6.0% | 2.6% | | 4.3% |
| 1999-03 | | 4.9% | 11.5% | 6.3% | 4.0% | | 4.0% |
| | | | | | | | |
| 1999-01 | | 3.7% | 16.8% | -11.8% | 3.1% | | 2.5% |
| 2000-02 | | 5.9% | 10.9% | 7.8% | 3.0% | | 3.9% |
| 2001-03 | | 6.2% | 6.5% | 28.2% | 4.9% | | 6.0% |

Source: Standard & Poor's, Quantitative Stock Reports

# Earnings Growth

*10 Water Companies*

| Year/Period | | Artesian | | American States | | CWS | | California Water | | Middlesex Water | | Pennichuck |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | $ | 0.71 | $ | 1.03 | $ | 0.96 | $ | 0.68 | $ | 1.16 | $ | 0.76 |
| 1996 | | 0.71 | | 1.13 | | 0.97 | | 0.60 | | 1.50 | | 0.84 |
| 1997 | | 0.71 | | 1.04 | | 1.00 | | 0.67 | | 1.83 | | 0.86 |
| 1998 | | 0.97 | | 1.08 | | 1.02 | | 0.71 | | 1.45 | | 1.19 |
| 1999 | | 0.97 | | 1.19 | | 1.03 | | 0.76 | | 1.53 | | 1.12 |
| 2000 | | 0.78 | | 1.27 | | 1.09 | | 0.51 | | 1.31 | | 1.55 |
| 2001 | | 1.05 | | 1.33 | | 1.10 | | 0.66 | | 0.97 | | 1.50 |
| 2002 | | 1.14 | | 1.34 | | 1.12 | | 0.73 | | 1.25 | | 0.97 |
| 2003 | | 0.96 | | 0.78 | | 1.15 | | 0.61 | | 1.21 | | 0.52 |
| *Annualized Growth Rates* | | | | | | | | | | | | |
| 1995-01 | | 6.7% | | 4.4% | | 2.3% | | -0.5% | | -2.9% | | 12.0% |
| 1996-02 | | 8.2% | | 2.9% | | 2.4% | | 3.3% | | -3.0% | | 2.4% |
| 1997-03 | | 5.2% | | -4.7% | | 2.4% | | -1.6% | | -6.7% | | -8.0% |
| 1997-01 | | 10.3% | | 6.3% | | 2.4% | | -0.4% | | -14.7% | | 14.9% |
| 1998-02 | | 4.1% | | 5.5% | | 2.4% | | 0.7% | | -3.6% | | -5.0% |
| 1999-03 | | -0.3% | | -10.0% | | 2.8% | | -5.3% | | -5.7% | | -17.5% |
| 1999-01 | | 4.0% | | 5.7% | | 3.3% | | -6.8% | | -20.4% | | 15.7% |
| 2000-02 | | 20.9% | | 2.7% | | 1.4% | | 19.6% | | -2.3% | | -20.9% |
| 2001-03 | | -4.4% | | -23.4% | | 2.2% | | -3.9% | | 11.7% | | -41.1% |

Source: Standard & Poor's, Quantitative Stock Reports

# Earnings Growth
*10 Water Companies*

| Year/Period | | SJW | Southwest | Aqua | York | | 10 Company Average |
|---|---|---|---|---|---|---|---|
| 1995 | $ | 1.18 | $ 0.12 | $ 0.38 | $ 0.46 | $ | 0.74 |
| 1996 | | 1.92 | 0.16 | 0.40 | 0.52 | | 0.88 |
| 1997 | | 1.60 | 0.21 | 0.45 | 0.54 | | 0.89 |
| 1998 | | 1.68 | 0.27 | 0.53 | 0.53 | | 0.94 |
| 1999 | | 1.73 | 0.45 | 0.45 | 0.52 | | 0.98 |
| 2000 | | 1.17 | 0.40 | 0.65 | 0.62 | | 0.94 |
| 2001 | | 1.53 | 0.44 | 0.70 | 0.65 | | 0.99 |
| 2002 | | 1.56 | 0.41 | 0.78 | 0.60 | | 0.99 |
| 2003 | | 2.04 | 0.47 | 0.79 | 0.70 | | 0.92 |
| | | | | | | | |
| *Annualized Growth Rates* | | | | | | | |
| 1995-01 | | 4.4% | 24.2% | 10.7% | 5.9% | | 6.7% |
| 1996-02 | | -3.4% | 17.0% | 11.8% | 2.4% | | 4.4% |
| 1997-03 | | 4.1% | 14.4% | 9.8% | 4.4% | | 1.9% |
| | | | | | | | |
| 1997-01 | | -1.1% | 20.3% | 11.7% | 4.7% | | 5.5% |
| 1998-02 | | -1.8% | 11.0% | 10.1% | 3.1% | | 2.7% |
| 1999-03 | | 4.2% | 1.1% | 15.1% | 7.7% | | -0.8% |
| | | | | | | | |
| 1999-01 | | -6.0% | -1.1% | 24.7% | 11.8% | | 3.1% |
| 2000-02 | | 15.5% | 1.2% | 9.5% | -1.6% | | 4.6% |
| 2001-03 | | 15.5% | 3.4% | 6.2% | 3.8% | | -3.0% |

Source: Standard & Poor's, Quantitative Stock Reports

# Book Value Growth

*10 Water Companies*

| Year/Period | | Artesian | | American States | | CWS | | California Water | | Middlesex Water | Pennichuck |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | $ | 9.90 | $ | 12.69 | $ | 9.73 | $ | 6.51 | $ | 14.53 | $ 8.52 |
| 1996 | | 9.72 | | 13.13 | | 10.00 | | 5.52 | | 15.32 | 8.86 |
| 1997 | | 9.86 | | 13.36 | | 10.28 | | 6.89 | | 16.21 | 9.15 |
| 1998 | | 10.23 | | 14.20 | | 8.51 | | 7.56 | | 16.67 | 10.88 |
| 1999 | | 10.67 | | 14.21 | | 11.15 | | 7.96 | | 17.49 | 11.27 |
| 2000 | | 19.28 | | 14.89 | | 11.65 | | 7.00 | | 16.77 | 18.68 |
| 2001 | | 11.17 | | 15.62 | | 12.78 | | 8.22 | | 17.28 | 12.81 |
| 2002 | | 20.67 | | 17.19 | | 9.97 | | 8.51 | | 17.78 | 21.20 |
| 2003 | | 21.29 | | 18.20 | | 14.79 | | 9.05 | | 19.61 | 21.73 |
| | | | | | | | | | | | |
| *Annualized Growth Rates* | | | | | | | | | | | |
| 1995-01 | | 2.0% | | 3.5% | | 4.6% | | 4.0% | | 2.9% | 7.0% |
| 1996-02 | | 13.4% | | 4.6% | | -0.1% | | 7.5% | | 2.5% | 15.7% |
| 1997-03 | | 13.7% | | 5.3% | | 6.3% | | 4.6% | | 3.2% | 15.5% |
| | | | | | | | | | | | |
| 1997-01 | | 3.2% | | 4.0% | | 5.6% | | 4.5% | | 1.6% | 8.8% |
| 1998-02 | | 19.2% | | 4.9% | | 4.0% | | 3.0% | | 1.6% | 18.1% |
| 1999-03 | | 18.9% | | 6.4% | | 7.3% | | 3.3% | | 2.9% | 17.8% |
| | | | | | | | | | | | |
| 1999-01 | | 2.3% | | 4.8% | | 7.1% | | 1.6% | | -0.6% | 6.6% |
| 2000-02 | | 3.5% | | 7.4% | | -7.5% | | 10.3% | | 3.0% | 6.5% |
| 2001-03 | | 38.1% | | 7.9% | | 7.6% | | 4.9% | | 6.5% | 30.2% |

Source: Standard & Poor's, Quantitative Stock Reports

# Book Value Growth

*10 Water Companies*

| Year/Period | | SJW | | Southwest | | Aqua | | York | | 10 Company Average |
|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | $ | 10.93 | $ | 4.03 | $ | 3.77 | $ | 4.27 | $ | 8.49 |
| 1996 | | 12.39 | | 4.34 | | 4.01 | | 4.83 | | 8.81 |
| 1997 | | 13.82 | | 4.96 | | 4.23 | | 4.97 | | 9.37 |
| 1998 | | 14.85 | | 5.43 | | 4.76 | | 5.10 | | 9.82 |
| 1999 | | 15.54 | | 5.76 | | 5.95 | | 5.22 | | 10.52 |
| 2000 | | NA | | 7.41 | | 6.20 | | 5.39 | | 11.92 |
| 2001 | | 15.76 | | 4.03 | | 7.06 | | 11.27 | | 11.60 |
| 2002 | | 16.80 | | 5.98 | | 3.93 | | 7.71 | | 12.97 |
| 2003 | | 17.83 | | 3.62 | | 9.48 | | 8.07 | | 14.37 |

| *Annualized Growth Rates* | | | | | |
|---|---|---|---|---|---|
| 1995-01 | 6.3% | 0.0% | 11.0% | 17.6% | 5.9% |
| 1996-02 | 5.2% | 5.5% | -0.3% | 8.1% | 6.2% |
| 1997-03 | 4.3% | -5.1% | 14.4% | 8.4% | 7.1% |
| | | | | | |
| 1997-01 | 3.3% | -5.1% | 13.7% | 22.7% | 6.2% |
| 1998-02 | 3.1% | 2.4% | -4.7% | 10.9% | 6.3% |
| 1999-03 | 3.5% | -11.0% | 12.3% | 11.5% | 7.3% |
| | | | | | |
| 1999-01 | 0.7% | -16.4% | 8.9% | 46.9% | 6.2% |
| 2000-02 | NA | -10.2% | -20.4% | 19.6% | 1.4% |
| 2001-03 | 6.4% | -5.2% | 15.9% | -15.4% | 9.7% |

<div align="center">

Appendix A

**Qualifications**

</div>

1

2

3

4  *Present Occupation*

5

6  **Q.**　**What is your present occupation?**

7  A.　I am a consulting economist and President of Ben Johnson Associates, Inc.®, a

8  firm of economic and analytic consultants specializing in the area of public utility

9  regulation.

10

11  *Educational Background*

12

13  **Q.**　**What is your educational background?**

14  A.　I graduated with honors from the University of South Florida with a Bachelor of

15  Arts degree in Economics in March 1974. I earned a Master of Science degree in

16  Economics at Florida State University in September 1977. The title of my

17  Master's Thesis is a "A Critique of Economic Theory as Applied to the Regulated

18  Firm." Finally, I graduated from Florida State University in April 1982 with the

19  Ph.D. degree in Economics. The title of my doctoral dissertation is "Executive

20  Compensation, Size, Profit, and Cost in the Electric Utility Industry."

21

22  *Clients*

23

24  **Q.**　**What types of clients employ your firm?**

25  A　Much of our work is performed on behalf of public agencies at every level of

26  government involved in utility regulation. These agencies include state regulatory

27  commissions, public counsels, attorneys general, and local governments, among

<div align="center">

1

</div>

1    others. We are also employed by various private organizations and firms, both

2    regulated and unregulated. The diversity of our clientele is illustrated below.

3

4    <u>Regulatory Commissions</u>

5

6    Alabama Public Service Commission—Public Staff for Utility Consumer Protection

7    Alaska Public Utilities Commission

8    Arizona Corporation Commission

9    Arkansas Public Service Commission

10   Connecticut Department of Public Utility Control

11   District of Columbia Public Service Commission

12   Idaho Public Utilities Commission

13   Idaho State Tax Commission

14   Iowa Department of Revenue and Finance

15   Kansas State Corporation Commission

16   Maine Public Utilities Commission

17   Minnesota Department of Public Service

18   Missouri Public Service Commission

19   National Association of State Utility Consumer Advocates

20   Nevada Public Service Commission

21   New Hampshire Public Utilities Commission

22   North Carolina Utilities Commission—Public Staff

23   Oklahoma Corporation Commission

24   Ontario Ministry of Culture and Communications

25   Staff of the Delaware Public Service Commission

26   Staff of the Georgia Public Service Commission

27   Texas Public Utilities Commission

28   Virginia State Corporation Commission

29   Washington Utilities and Transportation Commission

30   West Virginia Public Service Commission—Division of Consumer Advocate

31   Wisconsin Public Service Commission

32   Wyoming Public Service Commission

| 1 | Public Counsels |
|---|---|
| 2 | |
| 3 | Arizona Residential Utility Consumers Office |
| 4 | Colorado Office of Consumer Counsel |
| 5 | Colorado Office of Consumer Services |
| 6 | Connecticut Consumer Counsel |
| 7 | District of Columbia Office of People's Counsel |
| 8 | Florida Public Counsel |
| 9 | Georgia Consumers' Utility Counsel |
| 10 | Hawaii Division of Consumer Advocacy |
| 11 | Illinois Small Business Utility Advocate Office |
| 12 | Indiana Office of the Utility Consumer Counselor |
| 13 | Iowa Consumer Advocate |
| 14 | Maryland Office of People's Counsel |
| 15 | Minnesota Office of Consumer Services |
| 16 | Missouri Public Counsel |
| 17 | New Hampshire Consumer Counsel |
| 18 | Ohio Consumer Counsel |
| 19 | Pennsylvania Office of Consumer Advocate |
| 20 | Utah Department of Business Regulation—Committee of Consumer Services |
| 21 | |
| 22 | Attorneys General |
| 23 | |
| 24 | Arkansas Attorney General |
| 25 | Florida Attorney General—Antitrust Division |
| 26 | Idaho Attorney General |
| 27 | Kentucky Attorney General |
| 28 | Michigan Attorney General |
| 29 | Minnesota Attorney General |
| 30 | Nevada Attorney General's Office of Advocate for Customers of Public Utilities |
| 31 | South Carolina Attorney General |
| 32 | Utah Attorney General |
| 33 | Virginia Attorney General |

1         Washington Attorney General

2

3     <u>Local Governments</u>

4

5         City of Austin, TX

6         City of Corpus Christi, TX

7         City of Dallas, TX

8         City of El Paso, TX

9         City of Galveston, TX

10        City of Norfolk, VA

11        City of Phoenix, AZ

12        City of Richmond, VA

13        City of San Antonio, TX

14        City of Tucson, AZ

15        County of Augusta, VA

16        County of Henrico, VA

17        County of York, VA

18        Town of Ashland, VA

19

20        Town of Blacksburg, VA

21        Town of Pecos City, TX

22     _____

23     <u>Other Government Agencies</u>

24

25        Canada—Department of Communications

26        Hillsborough County Property Appraiser

27        Provincial Governments of Canada

28        Sarasota County Property Appraiser

29        State of Florida—Department of General Services

30        United States Department of Justice—Antitrust Division

31        Utah State Tax Commission

32

1    <u>Regulated Firms</u>

2

3        Alabama Power Company

4        Americall LDC, Inc.

5        BC Rail

6        CommuniGroup

7        Florida Association of Concerned Telephone Companies, Inc.

8        LDDS Communications, Inc.

9        Louisiana/Mississippi Resellers Association

10       Madison County Telephone Company

11       Montana Power Company

12       Mountain View Telephone Company

13       Nevada Power Company

14       Network I, Inc.

15       North Carolina Long Distance Association

16       Northern Lights Public Utility

17       Otter Tail Power Company

18       Pan-Alberta Gas, Ltd.

19       Resort Village Utility, Inc.

20       South Carolina Long Distance Association

21       Stanton Telephone

22       Teleconnect Company

23       Tennessee Resellers' Association

24       Westel Telecommunications

25       Yelcot Telephone Company, Inc.

26

27   <u>Other Private Organizations</u>

28

29       Arizona Center for Law in the Public Interest

30       Black United Fund of New Jersey

31       Casco Bank and Trust

32       Coalition of Boise Water Customers

1          Colorado Energy Advocacy Office

2          East Maine Medical Center

3          Georgia Legal Services Program

4          Harris Corporation

5          Helca Mining Company

6          Idaho Small Timber Companies

7          Independent Energy Producers of Idaho

8          Interstate Securities Corporation

9          J.R. Simplot Company

10        Merrill Trust Company

11        MICRON Semiconductor, Inc.

12        Native American Rights Fund

13        PenBay Memorial Hospital

14        Rosebud Enterprises, Inc.

15        Skokomish Indian Tribe

16        State Farm Insurance Company

17        Twin Falls Canal Company

18        World Center for Birds of Prey

19

20    *Prior Experience*

21

22    **Q.**    **Before becoming a consultant, what was your employment experience?**

23    A.    From August 1975 to September 1977, I held the position of Senior Utility

24        Analyst with Office of Public Counsel in Florida. From September 1974 until

25        August 1975, I held the position of Economic Analyst with the same office. Prior

26        to that time, I was employed by the law firm of Holland and Knight as a corporate

27        legal assistant.

28

1    **Q.**    **In how many formal utility regulatory proceedings have you been involved?**

2    **A.**    As a result of my experience with the Florida Public Counsel and my work as a

3          consulting economist, I have been actively involved in approximately 400

4          different formal regulatory proceedings concerning electric, telephone, natural

5          gas, railroad, and water and sewer utilities.

6

7    **Q.**    **Have you done any independent research and analysis in the field of**

8          **regulatory economics?**

9    **A.**    Yes, I have undertaken extensive research and analysis of various aspects of utility

10        regulation. Many of the resulting reports were prepared for the internal use of the

11        Florida Public Counsel. Others were prepared for use by the staff of the Florida

12        Legislature and for submission to the Arizona Corporation Commission, the

13        Florida Public Service Commission, the Canadian Department of

14        Communications, and the Provincial Governments of Canada, among others. In

15        addition, as I already mentioned, my Master's thesis concerned the theory of the

16        regulated firm.

17

18    **Q.**    **Have you testified previously as an expert witness in the area of public utility**

19        **regulation?**

20    **A.**    Yes. I have provided expert testimony on more than 250 occasions in proceedings

21        before state courts, federal courts, and regulatory commissions throughout the

22        United States and in Canada. I have presented or have pending expert testimony

23        before 35 state commissions, the Interstate Commerce Commission, the Federal

24        Communications Commission, the District of Columbia Public Service

25        Commission, the Alberta, Canada Public Utilities Board, and the Ontario Ministry

26        of Culture and Communication.

27

1   **Q.**   **What types of companies have you analyzed?**

2   **A.**   My work has involved more than 425 different telephone companies, covering the

3        entire spectrum from AT&T Communications to Stanton Telephone, and more

4        than 55 different electric utilities ranging in size from Texas Utilities Company to

5        Savannah Electric and Power Company. I have also analyzed more than 30 other

6        regulated firms, including water, sewer, natural gas, and railroad companies.

7

8   *Teaching and Publications*

9

10   **Q.**   **Have you ever lectured on the subject of regulatory economics?**

11   **A.**   Yes, I have lectured to undergraduate classes in economics at Florida State

12        University on various subjects related to public utility regulation and economic

13        theory. I have also addressed conferences and seminars sponsored by such

14        institutions as the National Association of Regulatory Utility Commissioners

15        (NARUC), the Marquette University College of Business Administration, the

16        Utah Division of Public Utilities and the University of Utah, the Competitive

17        Telecommunications Association (COMPTEL), the International Association of

18        Assessing Officers (IAAO), the Michigan State University Institute of Public

19        Utilities, the National Association of State Utility Consumer Advocates

20        (NASUCA), the Rural Electrification Administration (REA), North Carolina State

21        University, and the National Society of Rate of Return Analysts.

22

1    **Q.**    **Have you published any articles concerning public utility regulation?**

2    **A.**    Yes, I have authored or co-authored the following articles and comments:

3

4      "Attrition: A Problem for Public Utilities—Comment." *Public Utilities*

5      *Fortnightly*, March 2, 1978, pp. 32-33.

6

7      "The Attrition Problem: Underlying Causes and Regulatory Solutions." *Public*

8      *Utilities Fortnightly*, March 2, 1978, pp. 17-20.

9

10     "The Dilemma in Mixing Competition with Regulation." *Public Utilities*

11     *Fortnightly*, February 15, 1979, pp. 15-19.

12

13     "Cost Allocations: Limits, Problems, and Alternatives." *Public Utilities*

14     *Fortnightly*, December 4, 1980, pp. 33-36.

15

16     "AT&T is Wrong." *The New York Times*, February 13, 1982, p. 19.

17

18     "Deregulation and Divestiture in a Changing Telecommunications Industry," with

19     Sharon D. Thomas. *Public Utilities Fortnightly*, October 14, 1982, pp. 17-22.

20

21     "Is the Debt-Equity Spread Always Positive?" *Public Utilities Fortnightly*,

22     November 25, 1982, pp. 7-8.

23

24     "Working Capital: An Evaluation of Alternative Approaches." *Electric*

25     *Rate-Making*, December 1982/January 1983, pp. 36-39.

26

27     "The Staggers Rail Act of 1980: Deregulation Gone Awry," with Sharon D.

28     Thomas. *West Virginia Law Review*, Coal Issue 1983, pp. 725-738.

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"Bypassing the FCC: An Alternative Approach to Access Charges." *Public Utilities Fortnightly,* March 7, 1985, pp. 18-23.

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"On the Results of the Telephone Network's Demise—Comment," with Sharon D. Thomas. *Public Utilities Fortnightly,* May 1, 1986, pp. 6-7.

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"Universal Local Access Service Tariffs: An Alternative Approach to Access Charges." In *Public Utility Regulation in an Environment of Change,* edited by Patrick C. Mann and Harry M. Trebing, pp. 63-75. Proceedings of the Institute of Public Utilities Seventeenth Annual Conference. East Lansing, Michigan: Michigan State University Public Utilities Institute, 1987.

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With E. Ray Canterbery. Review of *The Economics of Telecommunications: Theory and Policy* by John T. Wenders. *Southern Economic Journal* 54.2 (October 1987).

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"The Marginal Costs of Subscriber Loops," A Paper Published in the Proceedings of the Symposia on Marginal Cost Techniques for Telephone Services. The National Regulatory Research Institute, July 15-19, 1990 and August 12-16, 1990.

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With E. Ray Canterbery and Don Reading. "Cost Savings from Nuclear Regulatory Reform: An Econometric Model." *Southern Economic Journal,* January 1996.

1    *Professional Memberships*

2

3    **Q.    Do you belong to any professional societies?**

4    A.    Yes.  I am a member of the American Economic Association.

5